

## REVISION OF THE AUSTRALIAN LÆMODIPODA.

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[Plates XLVIII.-XLIX.]

Since the publication of my "Catalogue of the Australian Stalk and Sessile-eyed Crustacea," two years ago, the appearance of Dr. Mayer's exhaustive monograph, "Die Caprelliden," has greatly added to, and brought into a convenient form, our knowledge of the structure and generic and specific forms of this group of Crustacea. On examining the Caprellidæ in my possession, I have found several new and interesting forms, and to the description of these add in the present paper a few notes on forms previously described.

The following is a list of the well-ascertained Australian species:—

1. *Proto Novæ Hollandicæ*. Haswell.
2. *P. condylata*. n. sp.
3. *P. spinosa*. n. sp.
4. *Protella australis*. Haswell.
5. *P. echinata*. Haswell.
6. *P. haswelliana*. Mayer.
7. *Hircella cornigera*. Haswell.
8. *Caprella aequilibra*. Say.
9. *Caprella attenuata*. Dana.
10. *Caprella inermis*. Haswell.

PROTO CONDYLATA. N. sp.

[Plate XLVIII., figs. 1-4.]

*Diagnosis.* Head and body without spines. Flagellum of superior antennæ with twenty articuli. Inferior antennæ two-thirds of the length of the superior pair, the flagellum with nine

articuli. Propodos of posterior gnathopoda in the male with a rounded process over the articulation of the dactylos; palm defined by a bifid denticle.

*Female*.—The head of this species is without spines, about equal in length to the following segment. The second, third, and fourth segments are nearly equal; the fifth and sixth are nearly equal in length, longer than the preceding three; the last segment is about half the length of the fifth. The superior antennæ are as long as the head and following three segments; the first and second segments of the peduncle are stout, the second the longer and somewhat narrower at the base than towards the extremity; the third segment is rather more than half the length of the second, narrower, being broadest towards the distal end; the flagellum is a little longer than the peduncle, with twenty articuli, of which the last is extremely small. The inferior antennæ are about two-thirds of the length of the superior pair, the second and third joints of the peduncle small, the fourth and fifth nearly equal, each nearly three times as long as the third; the flagellum is once and a half the length of the last segment of the peduncle and is composed of nine joints

The propodos of the anterior gnathopoda is triangular in lateral outline; the palm is very slightly convex, defined by a short tubercle and ornamented with short hairs. The posterior gnathopoda are as long as the superior antennæ ( $\frac{2}{3}$ ths of an inch); the propodos is  $\frac{1}{10}$ th of an inch in length, and nearly  $\frac{1}{3}$ rd of that in breadth, of a long oval shape in transverse outline, the upper (dorsal) border is slightly angulated near the middle, but nearer the proximal than the distal end; the lower (ventral) border has a well-defined palm which is slightly convex and is defined by two small tubercles, or more correctly, by one bifid tubercle, and has five serrations towards its distal end with a row of short setæ; the dactylos is more than half the length of the propodos, geniculate at the junction of its proximal with its middle third. The first and second pereopoda are slender, but as long as the others, (as long as the head and the two following segments— $\frac{3}{20}$ ths of an inch), with long narrow branchiæ. The two posterior pairs are short

the propodos and dactylos of the penultimate pair being rather larger than those of the last. The surface is dotted with minute black specs, and there are cross bands of similar dots on some of the appendages.

With the female specimens were a number of males, the majority of which differ from the female only (1) in having only seven segments in the flagellum of the lower antennæ (2) in having the first two pairs of pereipoda decidedly longer than the others, and (3) in having the last pair rather stouter than the penultimate. Among these, two, though resembling the rest in other respects differ from them in the form of the propodos of the posterior gnathopoda. In the first of these, which is otherwise like that of the female, the joint in question is relatively longer and narrower than in the latter. In the other, which I take to be the only completely adult male, the propodos (Pl. 48, fig. 3), is narrow at the base, broadening distally, with a strong rounded process at the dorsal and distal angle over the insertion of the dactylos, with a deeply concave palm defined by a double tubercle as in the female, with a quantity of fine hairs towards its middle and two very minute spines near its distal end; the dorsal process is ornamented with hairs; the extremity of the dactylos is slightly hooked.

PROTO SPINOSA. N. sp.

[Plate XLIX., fig. 1.]

*Diagnosis.* Head without spines: three following segments each with three spines; flagellum of superior antennæ with twenty-two or twenty-three articuli. Inferior antennæ equal in length to the peduncle of the superior pair; their flagellum with fourteen articuli. Propodos of posterior gnathopoda having the palm defined by two teeth an external and an intenal, with a groove between them in which the extremity of the dactylos lies.

The head with the coalescent first segment, the second, third, and fourth segments of the thorax are all nearly equal in length, the last being the longest. The fifth segment is longer than the fourth; the sixth is much shorter. The head is without spines,

but has a rounded eminence on its upper surface. The three following segments each bears three spines, a mesial dorsal, and two lateral, the latter placed immediately over the origin of the limbs; the spines of the first of these segments (second thoracic segment proper) are the most prominent, and are very acute and inclined forwards; the spines of the other two segments are conical, and are not inclined forwards. The fourth segment has also a short conical spine at its posterior end; the fifth has four short spines or tubercles in the same position as those of the fourth; the sixth and seventh have short, pointed spines over the insertion of the appendages. These posterior spines are not always present, the constant ones being those of the second and third segments. None of the rest of the segments possess spines. The superior antennæ are a little longer than the head and following three segments ( $\frac{7}{20}$ ths of an inch); the first segment is about half the length of the head; the second segment is twice the length of the first, slightly narrower proximally than distally, the third segment about two-thirds of the length of the second, much narrower; the flagellum a little longer than the two last segments of the peduncle, and consists of twenty-two or twenty-three segments. The lower antennæ are about equal in length to the peduncle of the superior pair ( $\frac{3}{20}$ ths of an inch); the fourth joint of its peduncle is the longest; the flagellum is slightly longer than the two last joints of the peduncle, and has fourteen articuli. The anterior gnathopoda are a little longer than the head; the propodos is triangular in lateral outline, with a well-defined palm, the defining lobe of which is divided into two small teeth, each with two short, stout setæ. The posterior gnathopoda are as long as the head and two following segments ( $\frac{1}{5}$ th of an inch); the propodos is longer than the head, long ovate, the palm convex, obscurely toothed distally, and defined by two prominent acute teeth, an internal and an external, between which is a hollow, in which the point of the dactylos lies when folded up; the dactylos is more than half the length of the propodos, nearly uniformly curved. The first two pairs of pereopoda are as long as the posterior gnathopoda, slender; the third pair are a little more than half the length of the

preceding pairs ; the two last pairs are as long as the two first, and stouter ; their propodos has a well-defined palm.

The branchiæ are narrow, cylindrical, and very long, about two-thirds of the length of the basal joint of the appendage.

The total length of the head and body is three-fifths of an inch.

I have seen specimens of this species only in one locality—Port Western, Victoria.

Of well-established species of *Proto*, besides the Australian forms there are, according to Mayer, only two, viz., *P. brunneo-vittata*, Haller, and *P. ventricosa*. O. F. Müller. The following synopsis will assist in showing the relations of the species.

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|----------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. Body without spines.    | } | I. Limbs without spines.<br>a. Palm of posterior gnathopoda with a defining tubercle, but without other projections.<br>1. A process on the large hand over the articulation of the dactylos. <i>P. condylata</i> . Haswell.<br>2. No process on the large hand. <i>P. ventricosa</i> . O. F. Müller.<br>b. Palm of posterior gnathopoda armed with teeth. <i>P. Novæ-Hollandiæ</i> . Haswell.<br>II. Third joint of the posterior gnathopoda with an acute spine. <i>P. brunneo-vittata</i> . Haller. |
| B. Body armed with spines. |   | <i>Proto. spinosa</i> . Haswell.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

PROTELLA AUSTRALIS.

[Plate XLIX, figs. 2-4 ]

*Protella australis*, Haswell. Proc Linn. Soc. New South Wales, Vol. IV., p. 276, pl. XII., fig. 4.

This species is characterised by the presence of a pair of short, acute, forwardly-directed spines on the head and by the extreme length of the superior antennæ, which equal the body in length, their peduncle being equal in length to the head and the following three segments of the body ; the flagellum on the other hand is comparatively short, not exceeding the third segment of the peduncle in length : it is composed of seventeen articuli. The inferior antennæ are relatively short, being no longer than the first two

segments of the peduncle of the superior pair: the fourth and fifth segments of its peduncle are of nearly equal length, the latter rather longer and more slender than the former; the flagellum is very short, not being half the length of the last segment of the peduncle; it is composed of six articuli. The propodos of the anterior gnathopoda has the "palm" undefined. The propodos of the gnathopoda is ovate; its palm is defined by an acute conical tooth, and it has two other teeth near its distal end, one proximal, acute, the other compressed. The branchiæ are long oval: the corresponding appendages are distinct, between a third and a half of the length of the branchiæ. The posterior pereopoda have the palm defined by a tooth-like projection.

The length of the body is over half an inch.

I have only found this species in Port Jackson. It is a very well-marked species and quite distinct from *P. gracilis* of Dana, to which Mayer is inclined to unite it, both in the form of the head and of the gnathopoda. The gnathopoda are not unlike those of *P. dentata* but in other respects the two species are quite different.

#### PROTELLA ECHINATA.

*Caprella echinata*. Haswell, Proc. Linn. Soc., N.S.W. Vol. IV., p. 346, pl. XXIII., fig. 2. Cat. Aust. Crust., p. 312.

*Protella echinata*. Mayer, Caprelliden, p. 32, figs. 6 and 7.

Mayer points out the presence of extremely reduced rudiments of anterior pereopoda, the presence of which places the species in the genus *Protella*, of which, however, it must be regarded as an outlying member.

#### PROTELLA HASWELLIANA.

*Protella Haswelliana*. Mayer, l.c., p. 32, figs. 8-10.

I append Mayer's remarks on this species:—

"With Haswell's consent I here describe this Australian species (of which a male and a female are at my disposal), as on account of a peculiarity in its structure it may be regarded as of especial interest. This consists in the coalescence of the last segment of the thorax with the penultimate, the former being thus deprived of independent movement; at the same time it is so reduced that its pair of appendages lie close up to the base of the preceding pair.

In contradistinction to this the fifth segment is very long and slender. The rudimentary feet of the branchial segment almost equal the branchiæ in length. The spines of the dorsal surface of the head and body are more strongly pronounced than in the other *Protelle*. Moreover, the basal segment of the anterior antennæ bears in its middle a small tubercle with one hair and the propodus of the posterior gnathopoda is also tuberculated on the dorsal side. The form of the abdomen I have not completely ascertained, but it does not seem to present any special peculiarities."

I have only found this species in Port Jackson.

#### HIRCELLA CORNIGERA.

*Caprella cornigera*, Haswell.

(?) *Proto cornigera*, Mayer, l.c., p. 25 fig. 3.

The following are Mayer's remarks on this species of which I forwarded him specimens for his Monograph:—

"The ten original specimens before me agree completely with Haswell's description, but they probably belong to the genus *Proto* as I was inclined to conclude on my first glance at the figure. This shows, to wit, three pairs of branchiæ arranged in the manner characteristic of *Proto*. \* \* \* The three anterior pairs of pereopoda were not figured by Haswell, and are also no longer present in my specimens. \* \* \* The muscles going to these limbs which in true *Protos* are by no means weak are so feebly developed that they have quite produced upon me the impression that the limbs have become rudimentary; one would then have to do with a form in which the reduction of the thoracic legs had gone even further than in the New Zealand genus *Caprellina*. Should this suspicion be borne out by the examination of fresh specimens the creation of a new generic name for (?) *Proto cornigera* would be unavoidable; I should like in that case to have proposed the name *Hircella*."

#### CAPRELLA ÆQUILIBRA.

*Caprella æquilibra*. Say. Journ. Acad. Philad. I.; Bate and Westwood, Vol. II., p. 71; Bate, p. 362, pl. LVII., fig. 5; Mayer, p. 45, pl. I., fig. 7; pl. II., figs. 1-11; pl. IV., figs. 20-25; pl. V., figs. 16-18; Miers, Collections of H.M.S. Alert, Crustacea, p. 320.

*Caprella jannuarii*. Dana. U. S. Expl. Expd., Crust., p. 819, pl. LV., fig. 2; Kroyer, Voy. en Scand., pl. VI., fig. 15.

*Caprella monacantha*. Heller.

*Caprella laticornis*. Boeck.

*Caprella obesa*. Haswell. Proc. Linn. Soc., N.S.W., Vol. IV., p. 348, pl. XXIV., fig. 1; Cat. Austr. Crust., p. 314.

This species is of very wide distribution, being found on the British and Scandinavian coasts, the Eastern coast of the United States and of South America; the coast of China and the coasts New South Wales and Victoria. Of the identity of the Australian with the European and American form there cannot remain the least doubt after the careful examination which Dr. Mayer has made of a considerable series of specimens.

#### CAPRELLA INERMIS.

*Caprella inermis*. Haswell. Proc. Linn. Soc., N.S.W., Vol. IV., p. 348, pl. XXIII., fig. 3; Cat. Austr. Crust., p. 314; Mayer Caprelliden, p. 71, figs. 26-29.

This species has been received by Dr. Mayer from Rio de Janeiro.

#### CAPRELLA ATTENUATA.

*Caprella attenuata*. Dana. U. S. Explor. Exped. Crust., p. 817, Pl. 55, fig. 1; Spence Bate, Cat. Amphip., p. 364, Pl. 57, fig. 7; Mayer, l.c., p. 67, figs. 24 and 25; Miers, Collections of H.M.S. Alert, p. 320.

This species has been found at Rio as well as in Port Jackson.

The species figured by Miers is very different from the adult *C. attenuata*, but may be an immature form.

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### EXPLANATION OF THE PLATES.

#### PLATE, XLVIII.

Fig. 1.—Anterior portion of *Proto condylata*.

Fig. 2.—Posterior gnathopoda of adult male of *Proto condylata*.

Fig. 3.—Posterior gnathopoda of male specimen of *Proto condylata*.

Fig. 4.—Anterior gnathopoda of adult male of *Proto condylata*.

#### PLATE XLIX.

Fig. 1.—*Proto spinosa*.

Fig. 2.—Anterior gnathopoda of *Protella australis*.

Fig. 3.—Posterior gnathopoda of *Protella australis*.

Fig. 4.—Pereiopoda of *Protella australis*.